

ASD Weekly Highlights for the Week Ending 17-Feb-2006

Operations

- Continue operating beam for commissioning
- Assist with cleanup and recovery from Klystron Gallery water spill
- Met with ARR Working group on ARR Post Start Action Items
- Met with Radiation Safety Committee on plan for Klystron Gallery.
- Continue with work on SNS Work Control
- Established a working group for Equipment Tracking for the Controls Group
- Met again with Chief Operator Candidate

Accelerator Physics

RF Systems

Ring RF

- Studied the operation of the control feedback loops simulating beam loading with the cavity dynamic tuning system. We believe we now have all three fundamental component stations operating properly.
- Plan to utilize the cavity dynamic tuning feature to help the LLRF feedback system control the rf phase and amplitude under high beam loading conditions.

Ion Source

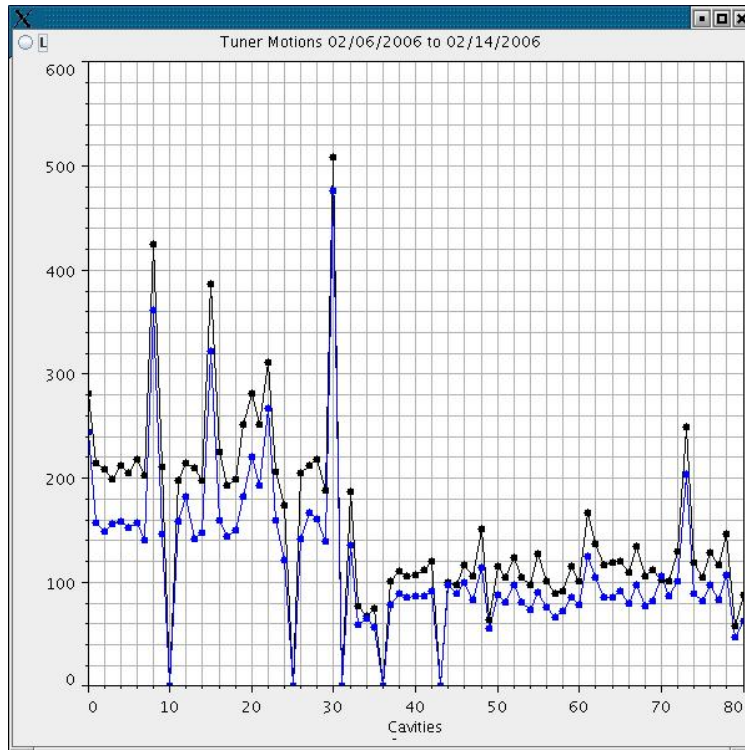
- The output of the FrontEnd ion source has steadily increased by tuning it for lower gas flows, yielding MEBT currents of ~37 mA peak and ~33 mA average with a gas flow of ~20 sccm.
- To gain more experience, we performed a 2nd cesiation shortly before the accelerator was shut down. It increased the MEBT beam current to ~41 mA peak and ~36 mA average with an optimized gas flow of ~25 sccm.
- We mapped the MEBT current as a function of extractor and electron-dump voltages. The 210 data show clearly that our extraction is near or in saturation. Increasing the extraction voltage by 30% increases the ion output by 5% with 29.3 sccm Hydrogen, and by 9% with 18.3 sccm Hydrogen. This is significantly less than the 48% increase expected for a space-charge limited extraction system.

Controls and Diagnostics

- This was the week of the great Klystron Gallery flood. The controls team found water in many systems (Vacuum, QMCS, RF, Network, MPS, etc) all of which were dried out and reinstalled in time for repowering by week's end. Three power supplies were replaced.
- Two more Windows-based OPIs were added to the control room and one more in the Software Development Area. A COW was installed in the RTBT Tunnel for upcoming Magnet/Power Supply Testing.
- LEBT/MEBT Chopper interlocks were implemented this week. The software interlock will turn off the MEBT Choppers if the LEBT Choppers are turned off or if the LEBT Chopper Power

Supplies are turned down below 1.5kV. The hardware interlock is a relay that breaks the enable line to the MEBT Chopper if the LEBT Chopper supplies are turned off. Work continued on adding the ramp-up mode to the LEBT/MEBT Chopper Controller. Preliminary research began on a new LEBT Chopper Switch Project.

- Debugging of the archiver and of the archive viewer continued. Some fixes are ready for deployment when the opportunity presents itself. A command line driven version of PSReport program was created.
- In addition to the previously announced capability to display the current daily Tuner Motor Motion Counts and Totals on an edm screen (yesterday's data), there is now a Jython script to retrieve the data from the archive and create a graph with the data summed over a date range for each cavity. (See sample plot below.)



- There has been considerable progress in the Personnel Safety Systems as the date for Phase 4 certification approaches. The PPS servers have been modularized such that PPS Server A with IOCA is talking with PLCA, and PPS Server B with IOCB is with PLCB. All Klystron Gallery chipmunk work that can be completed has been. The rack connections remain until Operations turn the system back over to PPS. A successful upgrade/change out/reconfiguration of the PPS servers and archiver was completed. Gamma blocker simulators were built and tested. Chipmunk calibration and testing is still in progress. Clear chipmunk covers/protectors were ordered for the Klystron Gallery Chipmunks. It seems to rain in that building.
- Construction resumes next week on the stack monitor. Integration is nearing completion on the Target PPS. All equipment is installed. This system will be tied into the accelerator PPS starting next week. Installation is complete on the Transfer Bay Access Control system. Integration testing will be completed next week. Certification testing awaits completion of the certification procedure. 75% of the RMS 3 radiation detectors are installed in the target building. The EPICS driver has been installed on the soft IOC to allow monitoring and archiving of these units from EPICS. The Target EPICS application is nearly complete. During calibration of the detectors, one

unit failed (out of 20) and will be returned to the factory for repair. Work is also progressing on the Instrument PPS construction and PLC programming.

- A three week shutdown period starts next week. During this shutdown installation and integration testing of the accelerator and target PPS (phase 4) will be completed. The required certification procedures will be performed the last week (March 6th). During this shutdown 10 Chipmunks will be added to the LINAC and 6 new Chipmunks installed in the target building for phase 4 (total of 47 units).
- The Diagnostics team was busy with many repairs, including DTL wire scanners 248 and 524, Ring BPM B08. Five sets of BNL BPMs were repaired and a BPM repair station was assembled. Cable terminations for the ring wire scanners were complete, and work continued on terminations for the harp in both the RTBT and on the Harp itself. Power controller terminations in DTL row 1 rack 1 were reconfigured to get devices on proper rebooter channels, and doors and fans were added to RTBT racks and Target Video rack.
- In the Target Building the Target Hot-Cell control room console was completed. Conduit has been routed and cable is being installed from flow element and transmitter to control room. Additional cable tray is being installed to the Telerob cabinets that will be installed on the High Bay. Modifications are also being made to the 50 ton crane.

SRF Facility

Project Upgrade

- FY06 SNS PUP funding had been anticipated at the \$1.5 M level.

DOE has increased the FY06 funding to \$2.5 M.

The FY06 budget plan has been revised as follows:

Conceptual Design Report (CDR) Prep	\$300 K
ASD	\$600 K
XFD	<u>\$1,600 K</u>
	\$2,500 K

The \$1.6 M allocated to XFD fully funds Target R & D for this year.

A meeting will be held in March, 06 to review progress toward implementing this funding plan.

- ASD personnel (Campisi/Stout) visited Fermi Lab last week for a meeting that included discussion of FNAL's progress on procuring a Horizontal Test Apparatus (HTA) for srf cavity testing. A plan has been developed that will allow an immediate start on a HTA procurement for SNS PUP based on modification of the FNAL drawing package by a qualified vendor. The estimated cost of the HTA is now \$200 K.

Survey and Alignment

- Harp vessel flange adjustment, BL17 base plate alignment, BL4A&B chopper alignment.
- RING:

- Continue modeling beam line trajectories through the Ring Injection Area

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RTBT:

Set Z-dimension on rad-hard guide “buttons”.
 Map RTBT-Target flight tube flange.
 Map rad-hard magnet mounting rails.
 Adjust rad-hard magnet mounting rails.
 Re-map rad-hard magnet mounting rails after adjustment.
 Set RTBT-Target flight tube flange.
 Map RTBT-Target flight tube flange.

TARGET:

BL3: Begin collimator/guide fiducialization in hut.
 BL2: Chopper NCS012-1 re-fiducialization in S&A lab.
 BL4B: Set chopper stands #2 and #1 in three dimensions.
 BL2: Re-pre-alignment of chopper NCS012-1 in S&A lab.
 BL3: Complete guide/collimator alignment in hut.
 BL4A&B: Chopper alignment in situ underway.

Miscellaneous:

Tracker #668 “flown into RTBT and reassembled.”
 Dan test-out of rad-worker I training.
 Disassembled tracker #677, move from the CLO to the Target, and reassembled.
 Remove tools and equipment from the RTBT.

Cryo Systems

Mechanical Systems

Shielding progress.

Ring Systems Installation Activities

- The RTBT tunnel “T” section was thoroughly cleaned to reduce potential future contamination.
- The RTBT beamline was installed and leak tested down to RTBT quad magnet QH26.
- The RTBT magnet QH26 cooling lines installation was completed.
- The RTBT Target Quads/HARP air and He lines’ installation continued.
- The RTBT HARP Vessel was leak tested.
- The RTBT HARP Assembly was operated under vacuum and modifications are underway.
- The RTBT Target Quad magnet chambers’ modifications were completed.
- The RTBT Target Quad magnet Q30 chamber/bellows assy was installed.
- The RTBT Quad magnets’ support rails were aligned.
- The RTBT Quad magnets’ alignment guides were installed.
- The RTBT Target quad overhead shielding blocks’ welding assembly continued.
- The Target flight tube was realigned to facilitate the HARP Vessel remote flange coupling.

Ring Water Systems Installation

- The RTBT Magnet QH26 cooling installation was completed.
- The RTBT Target Quad Valve Panel Flow Switches were installed.
- The RTBT CCWS skid test and checkout continued.

Electrical Systems

HVCM SYSTEMS

- Recover SCLME-9 MEC rack from water damage due to cooling cart leak
- Remove and replace damaged Control Chassis and Panel View interface on SCLME-9
- Remove and replace B Ø IGBT assembly in SCLME-9
- Install new circuit breakers in SCLME-9 Power Distribution Chassis
- Repair and modify dynamic fault detection chassis in RFTF
- Spare Modulator SCR Firing Boards
- Assist with Klystron DI Water leak cleanup
- Waiting on Kerry to review Dave's drawing.

CHOPPER SYSTEMS

- Label interconnect cables on LEBT Choppers
- Continued work on LEBT spares
- Calibrated timing signals on LEBT choppers, resulting in a significant improvement in beam "islands" injected into ring
- Initiate labeling of equipment in RATSII

KICKER SYSTEMS

- Two attempts at reducing the extraction kicker noise were tried, one removing the RC network at the magnet tanks, which yielded more noise and another method of shorting across the RC networks, which reduced 20% of noise. We will be looking into the ac feeds next week.
- Install Oil Containment Dam in PFN Room
- Worked with Ken on gather drawings to show power distribution of PFN racks
- Review with Ken possibility of moving Clean power dist panel to Ring SS1, will meet with Bob Eason tomorrow about this

POWER SUPPLIES

- Fans were installed in the six, 4000 amp, magnet power supplies to aid in cooling fuses that have blown on two separate occasions in DHA10.
- PSI analog read-back filters were installed in kicker # 7 and # 9. Their PSIs were replaced due to noise spikes taking out their A/D converters. Additional filters for the remaining kickers are being assembled and will be installed upon completion.
- Testing of RTBT magnet power supplies.
- Received IE Power, power supply spare parts, inventoried and placed in cabinets and in RATS II.
- Prepare RTBT_MAG:PS_QH26 for testing
- Install Cooling Fans on RING_MAG:PS_DHA10 (Injection Septum)

DIAGNOSTICS SUPPORT

- Harp Jumper wiring for Diagnostics
- Install Conduit and wiring for HARP Controls at Junction Box
- Wire termination at HARP Junction Box

TARGET SUPPORT

- Installation and fabrication of Cabling for 2TU and Beam Line 4
- Stepper Motor Instrumentation Panel Fabrication for Target
- Target TPS Wiring

- Started drawings for Alex and Mark on Target Stepper motor panel
- Attended meetings on Beam lines 4 and 18
- Drawing design revisions and supervision support for Beam line 4A and 4B this week.
- Start gathering loads for Beam Line 18 to start designs.

GENERAL INSTALLATION

- As Built walk down to build spreadsheets and as built drawings for RTBT
- Review SRO work in progress and completion for Hazelwood work to start in RTBT area for next week
- Research mechanic interviews
- Complete documents for Tom to start walk down of ac power for Ring, RTBT and HEBT as built documentation.
- RSS RTBT complete and in review process
- RSS for Ring started; will start RSS for HEBT next week
- Selected cabinet and racks needed for storage in Lab Space areas; place orders next week.
- Labeled Racks and equipment in RTBT for painter